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10/574,868	01/16/2007	Stefano Giovanni Alberici	118264-162607	5462

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EXAMINER

CHANG, HANWAY

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/574,868

Applicant(s)

ALBERICI, STEFANO GIOVANNI

Examiner

Hanway Chang

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 15-21 have been considered but are moot in view of the new ground(s) of rejection.

Claims 1-14 have been cancelled.

Claims 22-23 have been added.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 15-20 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gerlach (US Pat. 4,810,880, hereinafter Gerlach) in view of Tsuno (US PGPub 2001/0052744, hereinafter Tsuno) and in view of Itabashi et al. (US Pat. 5,714,757, hereinafter Itabashi).

Regarding claims 15 and 16, Fig. 1 of Gerlach discloses producing an electron beam (15) with a field emission source (16) to excite a surface (12) of the sample (14) so that electrons are emitted therefrom (see col. 3, lines 45-51); receiving on an inlet (88) of an energy analyzer the electrons emitted from the excited surface (12) of the sample (14) (see col. 5, lines 16-18), with the emitted electrons producing a spectrum representative of a distribution of kinetic energies of the emitted electrons over the inlet

(see col. 5, lines 59-67); detecting the emitted electrons traveling through the energy analyzer (82) for reproducing the distribution of the kinetic energies of the emitted electrons (see col. 5, lines 56-67). It should be noted that the detector (110) is shown to be placed substantially orthogonal to a radial direction of the energy analyzer.

A difference between Gerlach and the claimed invention is filtering the electron beam using a monochromator energy filter. However, Fig. 11 of Tsuno discloses a monochromator energy filter for filtering the electron beam to excite a surface of a sample (see paragraph [0061-0062]). It would have been obvious at the time of invention to a person of ordinary skill in the art to modify Gerlach by having a monochromator energy filter between the field emission source and the surface of the sample for the purpose of maintaining a constant energy electron beam to excite the surface.

A further difference between Gerlach and the claimed invention is identifying a characteristic kinetic energy associated with a peak of the reproduced distribution of the kinetic energies of the emitted electrons and determining chemical bond energy of the surface of the sample based at least in part on the identified characteristic kinetic energy. However, Itabashi discloses that particles emitted from the surface of a sample has an initial kinetic energy which holds information regarding at least the bonding state of the surface (see col. 4, lines 49-58). It would have been obvious at the time of invention to a person of ordinary skill in the art to modify Gerlach to use the emitted electrons to identify a kinetic energy to determine chemical bond energy of the surface of the sample.

Regarding claim 17, Fig. 1 of Gerlach discloses the energy analyzer (82) comprises a spherical capacitor energy analyzer (84 and 86) (see col. 5, lines 5-15).

Regarding claim 18, Gerlach discloses the claimed invention except for the monochromator energy filter reducing the energy dispersion to less than 0.2 eV. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Gerlach by reducing the energy dispersion of the electrons of the electron beam to less than 0.2 eV, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 19, Gerlach discloses the claimed invention except for the monochromator energy filter reducing the energy dispersion. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Gerlach by reducing the energy dispersion of the electrons of the electron beam to less than 0.1 eV, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

Regarding claim 20, Gerlach discloses the claimed invention except for the surface of the sample being excited by the electronic beam has linear dimensions less than or equal to 100 nanometers. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Gerlach by having the surface of the sample to be excited to have linear dimensions less than or equal to 100 nanometers, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

Regarding claim 23, Gerlach discloses providing a visualization (not shown) of the surface (12) based at least in part on the emitted electrons traveling through the energy analyzer (82) (see col. 5, lines 56-67).

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gerlach in view of Tsuno in view of Itabashi as applied to claims 15 above, as evidenced by Shinada et al. (US Pat. 6,583,413, hereinafter Shinada).

Regarding claim 21, a difference between Gerlach and the claimed invention is the field emission source comprises a Schottky emission source. However, in the same field of endeavor, Tsuno teaches the use a Schottky emission source as a field emission source (see paragraph [0048]). Shinada discloses the use of Schottky emission sources have advantages, such as providing stable electron emission over a long time (see col. 10, lines 9-15). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Gerlach by using a Schottky emission source for the purpose of providing stable electron emission over a long time as taught by Shinada.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gerlach in view of Tsuno in view of Itabashi as applied to claim 15 above, and in further view of Kar (Kar, R.J., "Composite Failure Analysis Handbook...", Feb. 1992, Wright-Patterson Air Force Base, pg. 6-37, hereinafter Kar).

Regarding claim 22, a difference between Gerlach and the claimed invention is determining the chemical bond energy accord to $BE = hv - KE - \Omega$. However, Kar discloses that electron emission from a sample can be used to calculate BE (bonding/binding energy) (see page 6-37). It should be noted that Ω is merely a constant which is a combination of the spectrometer work function (Φ) with the correction due to specimen charging (V_{charge}). It would have been obvious at the time of invention to a person of ordinary skill in the art to use a well known equation to find the bonding energy of a particle emitted from the surface of a sample.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanway Chang whose telephone number is (571)270-5766. The examiner can normally be reached on Monday to Friday 7:30 AM till 4 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hanway Chang
July 30, 2009
/H. C./
Examiner, Art Unit 2881

/ROBERT KIM/
Supervisory Patent Examiner, Art Unit 2881